Colloids and Surfaces A: Physicochem. Eng. Aspects 468 (2015) 40–48

Contents lists available at ScienceDirect

Colloids and Surfaces A: Physicochemical and Engineering Aspects

journal homepage: www.elsevier.com/locate/colsurfa

Self-organization and solubilization in binary systems based on hyperbranched polyesters polyols

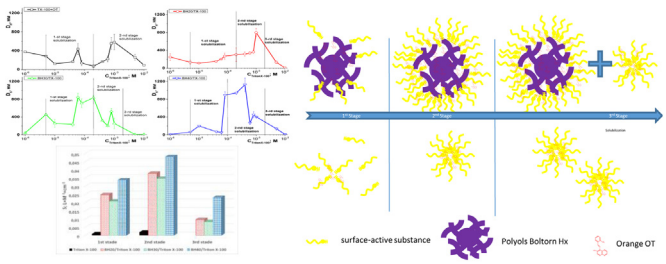
Marianna P. Kutyreva[a,*], Arthur A. Khannanov[a], Lucia Ya. Zakharova[b,c,**], Nikolay A. Ulakhovich[a], Gennadiy A. Kutyrev[c], Dinar R. Gabdrakhmanov[b,c]

[a] Kazan Federal University, 18, st. Kremlyovskaya, Kazan 420008, Russian Federation
[b] A.E. Arbuzov Institute of Organic and Physical Chemistry of Kazan Scientific Center of Russian Academy of Sciences, 8, st. Arbuzov, Kazan 420088, Russian Federation
[c] Kazan National Research Technological University, 68, st. K. Marx, Kazan 420015, Russian Federation

HIGHLIGHTS

- Research the structure of mixed micelles in binary systems Boltorn H/surfactant.
- Investigate the self-organization of binary systems Boltorn H/non-ionic surfactant.
- Investigate Orange OT solubilization by mixed micelles Boltorn H/surfactant.
- The influence of surfactants on self-organization of the Boltorn H structure.

GRAPHICAL ABSTRACT



ARTICLE INFO

Article history:
Received 8 September 2014
Received in revised form
27 November 2014
Accepted 30 November 2014
Available online 10 December 2014

Keywords:
Hyperbranched polyester polyols Boltorn H*x*
Polymer surfactant system
Binary systems
Self-organization
Solubilization

ABSTRACT

The work includes the determination of relationships of the solubilization process of biodegradable hyperbranched polyester polyols Boltorn H*x* of second, third and fourth generation by nonionic surfactants (TX-100, Brij-35, Tween-20). The impact of hyperbranched polyester polyols in binary systems Boltorn H*x*/surfactant on surface-active properties of surfactants, dimensions of assemblies and solubilization capacity has been estimated with respect to Orange OT dye. It has been shown that solubilization capacity rises by an order of magnitude in binary system Boltorn H*x*/TX-100 and decreases in binary system Boltorn H*x*/Tween-20.

1. Introduction

The polymers self-organization effect presents a profound theoretical interest in the field of obtaining materials with various composition, shape, structure and properties. Polymeric assemblies can have various applications: honeycomb structure models, biosensors, encapsulating agents for drug delivery and effective patterns for controlled construction of functional materials [1–4].

* Corresponding author. Tel.: +7 432 337 165; fax: +7 432 337 416.
** Corresponding author at: A.E. Arbuzov Institute of Organic and Physical Chemistry of Kazan Scientific Center of Russian Academy of Sciences, 8, st. Arbuzov, Kazan 420088, Russian Federation. Tel.: +7 843 272 1684; fax: +7 843 236 7542.
E-mail addresses: mkutyreva@mail.ru (M.P. Kutyreva), lucia@iopc.ru (L.Ya. Zakharova).

http://dx.doi.org/10.1016/j.colsurfa.2014.11.058
0927-7757/